Assignments
in Computer Architecture

CS-480/585: Computer Architecture

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Textbooks for these Assignments:

MURDOCCA, MILES J.; & HEURING, VINCENT P. (2000). *Principles of Computer Architecture.* Upper Saddle River, NJ: Prentice-Hall, Inc. QA76.9.A73 M86 2000; 004.2'2—dc21; 99-046113; ISBN 0-201-43664-7.

HILL, MARK D.; JOUPPI, NORMAN P.; & SOHI, GURINDAR S., editors (2000). *Readings in Computer Architecture.* San Francisco, CA: Morgan Kaufmann Publishers. QA76.9.A73H55 2000; 004.2'2—dc21; 99-44480; ISBN 1-55860-539-8.

Assignment 1a:

READINGS (both CS-480 and CS-585): *Principles of Computer Architecture* (Murdocca & Heuring):
1. Chapter 1: *Introduction*
2. Appendix A: *Digital Logic*, sections A.1 through A.8 (pages 441 through 458); skip section A.4.1

READINGS (CS-585 only): *Readings in Computer Architecture* (Hill, Jouppi, & Souhi):
3. Article by Gordon Moore, pp. 56-59.
4. Article by Stanley Mazor, pp. 60-68.

PROBLEMS: On pages 493-494 of Murdocca & Heuring: do problems A.3, A.6, A.7, A.8, A.9, A.10, and A.11. These problems will not be collected. HOWEVER, be aware that these and similar problems are good prospects for inclusion on the Final Exam, so please be sure to do them

conscientiously and to stay current on all problems. Send me an E-mail if you have trouble doing any of them, and I will endeavor to discuss it in class.

DELIVERABLE: Make up three multiple-choice questions. For CS-480 students, all three questions should be on the reading from Murdocca & Heuring, but for CS-585 students two of the questions should pertain to the readings from Hill, Jouppi, & Souhi. Each question must have at least four choices. The choices can include, if appropriate, an "all of the above" and a "none of the above". Submit your questions in the form of an E-mail addressed to abzugcx@JMU.edu with the Subject header: either: "CS-480-Assignment-1a" or CS-585-Assignment-1a", as appropriate. The content of the assignment must appear in the body of the E-mail; do NOT send the assignment as an enclosure. NOTE: (1) that that you must indicate for each question which of your answers you think is the right one, also (2) that your name must appear and you MUST have the proper subject header to get credit for the assignment; and also (3) that your assignment MUST include an Honor-Code declaration: "This work complies with the JMU Honor Code."

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Assignment 1b:

READINGS (both CS-480 and CS-585): *Principles of Computer Architecture* (Murdocca & Heuring):
  1. Appendix A: *Digital Logic*, sections A.9 through A.15 (pages 441 through 492).

READINGS (CS-585 only): *Readings in Computer Architecture* (Hill, Jouppi, & Souhi):
  2. Introduction to Chapter 1, pp. 1-15.

PROBLEMS: On pages 494-496 of Murdocca & Heuring: do problems A.12, A.13, A.14, A.15, A.18, and A.19. These problems will not be collected. HOWEVER, be aware that these and similar problems are good prospects for inclusion on the Final Exam, so please be sure to do them conscientiously and to stay current on all problems. Send me an E-mail if you have trouble doing any of them, and I will endeavor to discuss it in class.

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Assignment 2a:

READINGS (both CS-480 and CS-585): *Principles of Computer Architecture* (Murdocca & Heuring):
1. Chapter 2: *Data Representation*

READINGS (CS-585 only): *Readings in Computer Architecture* (Hill, Jouppi, & Souhi):
2. Section on Data Format (pages 21-24, and the figure on page 25) from the article by Amdahl *et al.* on the "Architecture of the IBM System/360".

PROBLEMS: On pages 56-60 of Murdocca & Heuring: do problems 2.1, 2.7 through 2.16, and 2.22. These problems will not be collected. HOWEVER, be aware that these and similar problems are good prospects for inclusion on the Final Exam, so please be sure to do them conscientiously and to stay current on all problems. Send me an E-mail if you have trouble doing any of them, and I will endeavor to discuss it in class.

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Assignment 2b:

READINGS (both CS-480 and CS-585): *Principles of Computer Architecture* (Murdocca & Heuring):
  1. Chapter 3: *Arithmetic*

READINGS (CS-585 only): *Readings in Computer Architecture* (Hill, Jouppi, & Souhi):
  2. Sections on Integer Execution Units and on Floating Point Execution Units (pages 282-284) from the article by K.C. Yeager on "The MIPS R10000 Superscalar Microprocessor."

PROBLEMS: On pages 95-98 of Murdocca & Heuring: do problems 3.1 through 3.6, 3.10, 3.12, 3.15, 3.18, and 3.19. These problems will not be collected. HOWEVER, be aware that these and similar problems are good prospects for inclusion on the Final Exam, so please be sure to do them conscientiously and to stay current on all problems. Send me an E-mail if you have trouble doing any of them, and I will endeavor to discuss it in class.

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Assignment 3a:

READINGS (both CS-480 and CS-585): *Principles of Computer Architecture* (Murdocca & Heuring):
1. Chapter 4: *The Instruction Set Architecture*

READINGS (CS-585 only): *Readings in Computer Architecture* (Hill, Jouppi, & Souhi):
2. Article by Anderson, Sparacio, and Tomasulo, pp. 185-201

PROBLEMS: On pages 146-150 of Murdocca & Heuring: do problems 4.1, 4.3(a), 4.4, 4.5, 4.6, 4.8, and 4.10. These problems will not be collected. HOWEVER, be aware that these and similar problems are good prospects for inclusion on the Final Exam, so please be sure to do them conscientiously and to stay current on all problems. Send me an E-mail if you have trouble doing any of them, and I will endeavor to discuss it in class.

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Assignment 3b:

READINGS (both CS-480 and CS-585): *Principles of Computer Architecture* (Murdocca & Heuring):
1. Chapter 5: *Languages and the Machine*

READINGS (CS-585 only): *Readings in Computer Architecture* (Hill, Jouppi, & Souhi):
2. Introduction to Chapter 3: *Instruction Sets,* pp. 111-117.
3. Article by William A. Wulf, pp. 119-125.
4. Article by George Radon, pp. 126-134.

PROBLEMS: On pages 186-188 of Murdocca & Heuring: do problems 5.1, 5.2, 5.3, 5.5, and 5.11. These problems will not be collected. HOWEVER, be aware that these and similar problems are good prospects for inclusion on the Final Exam, so please be sure to do them conscientiously and to stay current on all problems. Send me an E-mail if you have trouble doing any of them, and I will endeavor to discuss it in class.

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Assignment 4a:

READINGS (both CS-480 and CS-585): *Principles of Computer Architecture* (Murdocca & Heuring):
1. Chapter 6: *Datapath and Control*

READINGS (CS-585 only): *Readings in Computer Architecture* (Hill, Jouppi, & Souhi):
2. Introduction to Chapter 4, pp. 175-183.
3. Article by Patt, Wu, and Shebanow, pp. 238-243.
4. Article by Sohi and Vajapeyam, pp. 244-251.

PROBLEMS: On pages 235-242 of Murdocca & Heuring: do problems 6.2, 6.4, 6.5, 6.6, 6.7, and 6.21. These problems will not be collected. HOWEVER, be aware that these and similar problems are good prospects for inclusion on the Final Exam, so please be sure to do them conscientiously and to stay current on all problems. Send me an E-mail if you have trouble doing any of them, and I will endeavor to discuss it in class.

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